

U.S. Patent Application For

ACCESS PANEL LATCHING SYSTEM

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"EXPRESS MAIL" MAILING LABEL

Number: EL 652 334 310 US

Date of Deposit: November 21, 2000

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ACCESS PANEL LATCHING SYSTEM

FIELD OF THE INVENTION

5 The present invention relates generally to a system and method for protecting components within an enclosure, and particularly to a system for accessing electronic components housed within a protective enclosure.

BACKGROUND OF THE INVENTION

10 Many electronic devices are composed of electronic components electrically coupled together within a protective enclosure. For example, the central unit of a
15 desktop computer system typically consists of a microprocessor, hard drive, RAM, and power supply housed within a sheet metal enclosure. The central unit is typically coupled to a monitor, keyboard, printer, and mouse.

20 Protective enclosures for housing electronic components come in a variety of shapes and sizes. However, typically, they consist of a chassis with a removable cover. A cover is typically secured to the chassis by a

number of screws. Occasionally, the components within the protective enclosure need to be accessed, either for repair or upgrade. To remove the cover and access the components, the screws securing the cover to the chassis must be

5 removed. A tool, such as a screwdriver or drill, is needed to remove the screws from the enclosure. Additionally, installing and removing the screws consumes time, and the screws may be lost, adding additional time to the process.

10 Therefore, it would be advantageous to have a system that would allow access to the interior of a protective enclosure quickly, without the use of tools and producing no loose parts.

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SUMMARY OF THE INVENTION

A protective assembly for a computer system is featured. The protective assembly includes a chassis, an access panel, a latch member and a catch member. The latch
20 member is secured to the access panel. The catch member is movably secured to the chassis and is biased by a spring to a first position on the chassis to secure the latch member.

According to another aspect of the present invention,
a first member securable to a second member to form a
moveable securing mechanism for securing a latch member to
a chassis is featured. The first member includes a first
5 surface configured for sliding engagement with the latch
member as the access panel is pivoted towards a closed
position on the chassis. The first member also includes a
second surface configured to restrict movement of the latch
member when the access panel is disposed in the closed
10 position on the chassis.

According to another aspect of the present invention,
a method of securing an access panel to a chassis is
provided. The access panel has a latch member and the
15 chassis has a moveable catch member biased to a first
position on the chassis. The method includes the step of
pivoting a first end of the access panel towards a closed
position on the chassis. The method also includes the step
of displacing the moveable catch member from the first
20 position with the latch member. The method further
includes the step of disposing the access panel in the
closed position on the chassis. The moveable catch member
is no longer displaced by the latch member and is biased

back to the first position, thereby securing the latch member.

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BRIEF DESCRIPTION OF THE DRAWINGS

The invention will hereafter be described with reference to the accompanying drawings, wherein like reference numerals denote like elements, and:

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Figure 1 is a perspective view of a protective enclosure for a computer system, according to a preferred embodiment of the present invention;

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Figure 2 is a perspective view of the protective enclosure of Figure 1 featuring an access panel in an open position;

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Figure 3 is a cross-sectional view taken along line 3-3 of Figure 2;

Figure 3A is a cross-sectional view taken along line 3A-3A of Figure 3;

Figure 4 is a cross-sectional view similar to Figure 3, illustrating the operation of the access panel securing system during the closing of the access panel;

5 Figure 4A is a cross-sectional view of the area defined by line 4A-4A of Figure 4;

10 Figure 5 is a cross-sectional view similar to Figure 3, illustrating the operation of the access panel securing system once the access panel is closed;

15 Figure 6 is a cross-sectional view similar to Figure 3, illustrating the operation of the access panel securing system during the opening of the access panel;

Figure 6A is a cross-sectional view illustrating the operation of the leaf spring in opening the access panel;

20 Figure 7 is a cross-sectional view taken along line 7-7 of Figure 2;

Figure 7A is a cross-sectional view taken along line 7A-7A of Figure 7,

Figure 8 is a bottom elevational view of an access panel, according to a preferred embodiment of the present invention;

5 Figure 9 is an elevational view of a catch release, illustrating the side of the catch release facing an inner member of a catch mechanism, according to a preferred embodiment of the present invention;

10 Figure 10 is an elevational view of the catch release of Figure 9, illustrating the side of the catch release that is visible from the exterior of a protective enclosure;

15 Figure 11 is an elevational view of a portion of the exterior of a protective enclosure, according to a preferred embodiment of the present invention;;

20 Figure 12 is an elevational view of an inner member, illustrating the side of the inner member that faces the catch release, according to a preferred embodiment of the present invention;

Figure 13 is an elevational view of the inner member of Figure 12, illustrating the side of the inner member that faces the interior of an enclosure; and

5 Figure 14 is an alternative exemplary embodiment of a protective enclosure for a computer system.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

10 Referring generally to Figure 1, a computer system enclosure 20 is featured. Enclosure 20 includes a chassis 22, a front bezel 24, a rear panel 26, an access panel 28, and two moveable catches 30 for securing access panel 28 to chassis 22. Each movable catch 30 is operated by a catch
15 release 32 accessible from the exterior of chassis 22. In the illustrated embodiment, each moveable catch 30 is disposed on two sides 33 of chassis 22, towards rear panel 26. Each catch release 32 is disposed in a recess 34 in each side 33 so as to minimize the profile of catch release
20 32. In the illustrated embodiment, access panel 28 is released from chassis 22 by sliding both catch releases 32 towards rear panel 26.

Referring generally to Figure 2, chassis 22 is illustrated with access panel 28 in an open, or unsecured, position. The closed, or secured, position of panel 28 is shown in dashed lines. As best illustrated in Figure 8, access panel 28 includes two tabs 36 used to secure access panel 28 to chassis 22. Alternatively, access panel 28 may be configured with one tab, or more than two tabs.

Referring again to Figure 2, to secure access panel 28 to chassis 22 each tab 36 is seated under a lip 38 on the top rear portion of front bezel 24. Lip 38 and tabs 26 enable access panel 28 to be pivoted into the closed position. However, lip 38 prevents movement of tabs 36 when access panel 28 is in the closed position on chassis 28. Alternatively, the end of access panel 28 proximate front bezel 24 can be secured to chassis 22 by another mechanism, such as a hinge.

Figure 2 also illustrates latch 40 of access panel 28. Chassis 22 and access panel 28 are preferably formed of sheet metal with latch 40 being formed by a series of bending operations on access panel 28. However, latch 40 can also be formed separately. Latch 40 includes an angled

latch portion 42, a flat latch portion 44, and a connecting member 46.

Access panel 28 also includes two support rails 48 that extend along the sides of panel 28. As best illustrated in Figure 8, each support rail 48 includes a plurality of holes 50. A ground spring 52 is disposed between each hole 50 and the main cover portion 54 of access panel 28. Each rail 48 rests on a first bracket surface 56 and a second bracket surface 58 on each side 33 of chassis 22. First bracket 56 includes a plurality of ground tabs 60. Each ground tab 60 is configured for insertion through each hole 50 of access panel 28 so as to contact ground spring 52 and ground access panel 28 to chassis 22. Second bracket 58 is configured with a leaf spring 62 to bias access panel 28 to an open position.

Referring generally to Figures 3 and 3A, movable catch 30 also includes an inner member 64 secured to release switch 32, shown in dashed lines. As best illustrated in Figure 11, inner member 64 is connected to release switch 32 through a hole 66 in chassis 22. Movable catch 30 includes a block portion 68 that extends through hole 66.

Block 68 has a side opening 70 that allows movable catch 30 to travel along a guide member 72 formed in chassis 22.

Block 68 could be disposed on release switch 32 or inner member 64. However, in the illustrated embodiment, block

5 68 is disposed on release switch 32. Chassis 22 also includes two tabs 74 that cooperate with block 68 and guide member 72 to secure a biasing spring 76.

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10 In the illustrated embodiment, inner member 64 includes a raised member 78 having an angled catch portion 80 and a flat catch portion 82. Inner member 64 also includes a hole 84 through which a screw 86 is inserted to secure inner member 64 to release switch 32. As best illustrated in Figure 9, release switch 32 includes a
15 corresponding threaded hole 88 into which screw 86 is threaded. As best illustrated in Figure 12, inner member 64 includes four guideposts 90 that are configured for insertion into four guide holes 92 in central block 68.

20 Referring again to Figure 3, the illustrated embodiment of raised member 78 includes a second angled catch portion 94 and a second flat catch portion 96. Second angled catch portion 94 and second flat catch

portion 96 are symmetrical about an axis with angled catch portion 80 and flat catch portion 82. The symmetry of inner member 64 allows a single design to be used on opposite sides of chassis 22.

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In the exemplary embodiment, two movable catches 30 are used to secure access panel 28 to chassis 22. The operation of each movable catch 30, preferably, is identical. Therefore, for clarity the following discussion of the operation of movable catch 30 will refer only to a single movable catch 30.

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Referring generally to Figures 4 and 4A, as access panel 28 is being closed, angled latch portion 42 of access panel 28 contacts first angled catch portion 80 of inner member 64. In this view, as access panel 28 is pivoted downward, angled latch portion 42 forces inner member 64 to the right, causing spring 76 to be compressed. Angled latch portion 42 of access panel 28 slides along the surface of angled catch portion 80 as it forces inner member 64 to the right.

Referring generally to Figure 5, access panel 28 eventually pivots to a point where angled latch portion 42 no longer engages angled catch portion 80. When that point is reached, the force of compression in spring 76 pushes
5 block 68 to the left towards a biased position. The movement of movable catch 30 to the biased position causes flat catch portion 82 to be placed over flat latch portion 44. Flat catch portion 82 blocks movement of flat latch
10 portion 44. The flat catch portions 82 of two movable catches 30 and lip 38 thus cooperate to secure access panel 28 to chassis 22. Additionally, the spring force of leaf spring 62 must be overcome to place access panel 28 in the closed position.

15 Referring generally to Figures 6 and 6A, release switch 32 is operated to displace movable catch 30 from the biased position to gain access to chassis 22. An operator displaces movable catch 30 laterally to remove flat catch portion 82 from its blocking position over flat latch
20 portion 44. As best illustrated in Figure 6A, the force of leaf spring 62 then forces edge 98 of access panel 28 upward. This makes it easier for an operator to grab access panel 28 and remove it from chassis 22.

Referring generally to Figures 7 and 7A,
electromagnetic shielding for enclosure 20 is provided by a
system of ground springs 52 and ground tabs 60. Each tab
60 on chassis 22 is inserted through a respective hole 50
5 in support 48 of access panel 28 when access panel 28 is
installed in a closed position on chassis 22. In the
illustrated embodiment, ground springs 52 are formed of a
strip of metal fixed at one end 100 to support 48. Each
tab 60 contacts a free end 102 of a respective ground
10 spring 52, thus grounding panel 28 to chassis 22.

Referring generally to Figure 8, a bottom view of
access panel 28 is featured. Preferably, access panel 28
is made from a sheet metal. In the illustrated embodiment,
15 latch 40 and support rails 48 are formed by a series of
bending operations on the sheet metal of access panel 28.

Referring generally to Figures 9 and 10, front and
back views of the release switch 32 are illustrated.
20 Figure 9 illustrates the side of catch release 32 facing
inner member 64. Figure 10 illustrates the side of catch
release 32 that is visible from the exterior of protective
enclosure 20. Raised ridges 103 are provided on the outer

surface of release switch 32 to enable an operator to more easily operate release switch 32.

Referring generally to Figure 11, an exterior view is shown of base 22. This view illustrates recessed landing 34, hole 66, and guide member 72.

Referring generally to Figures 12 and 13, front and back views of inner member 64 are illustrated. Figure 12 illustrates the side of inner member 64 that faces catch release 32. Figure 13 illustrates the side of the inner member that faces the interior of enclosure 20.

Referring generally to Figure 14, an alternative embodiment of a chassis 104 is shown. In the illustrated embodiment, chassis 104 is configured so that movable catch 30 is proximate to front bezel 24 so that access panel 28 may be removed from the front of chassis 22, rather than the back.

It will be understood that the foregoing description is of preferred exemplary embodiments of this invention, and that the invention is not limited to the specific forms

shown. For example, elements, such as latch 40 and
brackets 56 and 58 described as portions of chassis 22 and
access panel 28, may be formed separately and secured to
chassis 22 and access panel 28. These and other
5 modifications may be made in the design and arrangement of
the elements without departing from the scope of the
invention as expressed in the appended claims.

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